SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CRC 497	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* Enlisted Accessions of Navy Veterans to the Selected Reserve		5. TYPE OF REPORT & PERIOD COVERED 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR*(s)* Aline O. Quester		8. CONTRACT OR GRANT NUMBER*(s)* N00014-76-C-0001
9. PERFORMING ORGANIZATION NAME AND ADDRESS Center for Naval Analyses 2000 No. Beauregard Street Alexandria, Virginia 22311		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Department of the Navy Arlington, Virginia 22317		12. REPORT DATE August 1983 13. NUMBER OF PAGES 57
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)* Office of the Chief of Naval Operations (Op91) Department of the Navy Washington, D.C. 20350		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

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18. SUPPLEMENTARY NOTES

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Military reserves, Personnel retention, Salaries, SELRES (Selected Reserves) Unemployment

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

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CRC 497 / August 1983

ENLISTED ACCESSIONS OF NAVY VETERANS TO THE SELECTED RESERVE

Aline O. Quester

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3 November 1983

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2. This Research Contribution was prepared in connection with the Enlisted Selected Reserve Analyses (ESRA) Study. It shows that accessions of Navy veterans to the Selected Reserve (SELRES) increase with increases in reserve pay and the civilian unemployment rate. The results can be used to calculate the level of affiliation bonuses that will attract Navy veterans to hard-to-fill billets.

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Andrew Borden

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CRC 497 / August 1983

ENLISTED ACCESSIONS OF NAVY VETERANS TO THE SELECTED RESERVE

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ABSTRACT

Enlisted accessions of Navy veterans in 51 ratings to the Navy's Selected Reserve are modeled over a 5-year period. Nonlinear probit estimates of the probability of enlistment are obtained for 23 rating groups. The probabilities of enlistment are found to be positively related to reserve pay, the unemployment rate, and the Navy rating.

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INTRODUCTION

Although a substantial body of research exists on enlistment in the active Navy, there is a dearth of research on enlistment in the Navy's reserve programs. Moreover, there is substantial current interest in the determinants of enlistment in the Navy's Selected Reserve (SELRES). Selected Reservists attend military duty (drills) one weekend a month and go on active duty for training 2 weeks each year. The only reservists who train actively, they are the first mobilization asset.

Although the advent of the All-Volunteer Force saw SELRES end-strength fall, by FY 1979 the number of selected reserve officers and enlisted personnel had stabilized at about 87,000. In fiscal 1982, end-strength rose to 94,000, but current planning dictates an even larger requirement--in excess of 124,000 drilling reservists by 1988. Given this programmed growth, attainability becomes the issue: evaluating attainability requires an understanding of the parameters which affect the SELRES enlistment decision.

Here we concentrate solely on enlisted personnel and focus primarily on Navy veterans (NAVETs)--individuals who voluntarily choose to affiliate with SELRES. Since 1977, enlisted SELRES accessions have varied from 24,916 to 31,084 per year with the bulk of these accessions being Navy veterans (table 1). In 1982, for example, over 69 percent of the 28,280 SELRES enlisted accessions were NAVETs.

Veterans of the active Navy can join SELRES at the same paygrade they held upon leaving the active force, as long as they have the appropriate eligibility codes and have not been out of the active service for more than 10 years.* Thus the potential pool of NAVETs is both large and diffuse, but about one-third of the NAVET accessions occur within a year after individuals leave the active Navy. Our analysis will concentrate on these recent USN separatees. A major advantage of such a focus is that it allows us to precisely define the accession pool. Moreover, taking the accession pool from "eligible" individuals leaving the active Navy allows us to use the Enlisted Master Records (EMRs) rather than the Inactive Manpower Management Information

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Mr. David Gregory, Cdr. Lawrence Curran and Cdr. Kurt Driscoll all provided valuable contributions to this paper. Their help is gratefully acknowledged. This paper is part of a larger study, "Enlisted Selected Reserve Analyses (ESRA)," directed by Dr. Jean Fletcher.

* Individuals who could have reenlisted in the active Navy have eligibility codes which enable them to enlist in SELRES without waivers. Individuals whose eligibility codes would require waivers are excluded from the analysis.

System (IMAPMIS) files for personal as well as service history variables.*

TABLE 1

ENLISTED SELRES ACCESSIONS

	Total	Navy veterans	Other-service veterans	Advanced paygrade	Active Mariners (A/M)	Ready Mariners (R/M)
1977	28,600	17,659	703	2,004	6,220	2,014
1978	25,741	18,047	1,039	2,077	2,561	2,017
1979	31,084	16,692	1,429	5,349	5,705	1,909
1980	26,287	13,790	1,030	3,142	6,652	1,673
1981	24,916	14,329	670	1,424	6,485	2,008
1982	28,280	19,625	539	1,083	5,024	2,009

Note: Navy veterans, other-service veterans, and advanced paygrade are all voluntary programs. The A/M and the R/M programs involve an active duty commitment and then a SELRES drilling obligation.

We estimate "availability" or the supply curve for NAVETs with appropriate eligibility codes in open ratings. These individuals can affiliate with SELRES no matter where they live. Furthermore, we concentrate on the lower paygrades (E-1 through E-5) where most concerns about SELRES attainability focus. Additionally, we restrict our analysis to individuals with less than 77 months of active service. Modeling the potential retirement attraction of SELRES for more senior personnel would have considerably complicated the analysis.**

* Data inadequacies in the IMAPMIS files have been detailed elsewhere. Deficiencies particularly relevant for this study include the inability to separate mandatory and voluntary drillers, define years of active duty, or calculate properly normed AFQT scores. See [1].

** The analysis focuses on the decision to affiliate with SELRES for individuals who have already left the active Navy. An alternative formulation is a trichotomous choice: reenlisting in the active Navy, leaving the active Navy and joining SELRES, or leaving the active Navy and not joining SELRES. We rejected such a formulation primarily because of time constraints. Additionally, however, we would argue that, for most individuals, the decision is probably sequential: first a decision is made between a full-time Navy job and a full-time civilian job. Only after that decision is made, and thus only for individuals who decide to leave the active Navy, is any consideration given to SELRES affiliation.

THE DATA AND THE MODEL

As a result of previous research at CNA, a file of Navy personnel who reached their expiration of active obligated service (EAOS) during FY 1977-80 was established. From this file we extracted all NAVETs in SELRES open ratings who left the active Navy with less than 77 months of service, had eligibility codes that did not require waivers for enlistment, and were at paygrades E-5 and below. There were 58,035 NAVETs in 51 ratings who fit the above characteristics. Next we determined which NAVETs joined SELRES by matching the 58,035 FY 1977-80 eligibles with our FY 1976-81 SELRES Longitudinal File. (See [6] for a description of this file.) Thirteen percent of the NAVETs joined SELRES.

What variables, though, are important determinants of an individual's joining (or not joining) SELRES? Because of work with the active Navy, we hypothesized that personal, economic, and military service variables would be relevant.* Specifically, in our model SELRES affiliation is a function of the following variables:

SELRES enlistment = f (civilian unemployment rate, real military pay, rating, mental group, age, and universal military training obligation)

We shall discuss each of these variables in turn.

Unemployment Rate

SELRES participation is expected to be more attractive the higher the unemployment rate. For individuals who are employed, SELRES affiliation provides a hedge against the probability of becoming unemployed. For the unemployed, SELRES provides some financial relief. In our empirical specification, we focus on the male unemployment rate for 20- to 24-year-olds, but estimates which measure unemployment by the adult male unemployment rate are also provided.

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* The only previous empirical work on reserves was for Army reservists at the reserve reenlistment point. Economic variables were not found to be important in explaining these reservists' reenlistment decision. There are, however, several reasons why pay might be less important for individuals who reach the reserve reenlistment point. In particular, since attrition from the reserves is essentially costless, individuals disgruntled with reserve pay leave SELRES prior to the completion of their contract. We, in fact, have decided that retention rates, not reenlistment rates, are the appropriate variables on which to focus attention. (See [2] for Army reservist study and [3] for work on retention.)

Real Military Pay

The second economic variable that is posited to increase SELRES attractiveness is military pay.* We present two specifications. The first, MILCIV1, is the yearly percentage increase in military pay deflated by the percentage increase in the Consumer Price Index. The second, MILCIV2, is the same yearly percentage increase in military pay, but deflated by the percentage increase in civilian wages. Both variables vary only by year. MILCIV1, for example, has its smallest value, .48, in 1979 and its largest value, 1.15, in 1981.**

Personal Characteristics

We control for the individual's age when he left the active Navy and his mental group. The eight mental group categories are: I (coded 1), II, IIIU, IIIL, IVA, IVB, IVC, and V (coded 8). Unfortunately, not all observations had AFQT test score data, and mental group category could not always be identified. Rather than exclude these observations,

---

* Reference [2] discusses measurement problems associated with reserve pay. Essentially the problem is that an individual's return from the 2 weeks' active duty for training (about 1/4 of yearly reserve compensation) depends not only upon reserve pay but also upon the civilian employer's policy toward reservists. Some employers give time off with pay for these 2 weeks, others offset the difference between reserve pay and regular civilian pay, while still others require the reservist to take vacation time or leave without pay for these 2 weeks.

We believe that this measurement problem is minimized in the analysis discussed here. By restricting the focus to NAVETs who are just leaving active duty, we analyze an enlistment decision made before many individuals know their civilian employer's policy toward reserve compensation. In short, we analyze a situation in which the majority of SELRES enlistees believe that our measure of reserve pay is what they will receive as compensation.

** Initially we carefully calculated each individual's reserve pay (as a function of paygrade, LOS, and the year in which he left the active Navy) and his civilian pay (as the mean of individuals of the same age, sex, and schooling). This type of specification was never successful. We suggest there are several reasons: (1) the most important source of variation in individual pay for our data is paygrade. Within rating groups, E-5s are not systematically more likely to join SELRES than are E-4s. Upon reflection this is not surprising: individuals who advanced more rapidly in the active Navy than their cohorts, but decided to leave the active Navy, probably have a stronger distaste for military life than those who left the active Navy after an average advanced pattern. (2) Our proxies for civilian pay alternatives (the wages for moonlighting) are not sufficiently precise. As the empirical work to follow shows, however, variations in the SELRES affiliation rate are importantly related to yearly variation in military pay.

we assigned them a value of zero and flagged them with the dummy variable (MGDUM).* Early specifications also controlled for education, but since education measures never achieved statistical significance they were dropped from the analysis.

Military Service Variables

The only military service variable we utilize is a dummy variable for a remaining universal military training (UMT) obligation. By law, all individuals who enter the military have a 6-year training obligation. Effectively this means that if their period of active duty is less than 6 years, they will be transferred into the Individual Ready Reserve (IRR) for the remainder of their 6-year obligation. IRR membership involves no active participation, but individuals in the IRR are subject to recall during mobilization. If individuals are already in the mobilization pool, they might be more likely to affiliate with SELRES. To capture this effect, UMT assumes the value one if the individual leaves the active Navy with at least 2 years remaining on his universal military training obligation.**

EMPIRICAL ESTIMATION FOR NAVETs

We want to estimate the probability of joining SELRES. Since the probability that any individual joins cannot be less than zero or greater than one, a nonlinear functional form, like the probit function, is appropriate. Such a function is illustrated in figure 1. (See [4] for a fuller description of probit analysis.) It is not practical, however, to estimate a nonlinear probit model with 58,000 observations. Thus, we partitioned the sample into 23 rating groups, and estimated separate probit equations for each group. (Appendix A presents the results of an ordinary least squares regression for the entire sample of 58,035 NAVETs. Even though ordinary least squares is not the

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* With this procedure, missing variables for an observation do not necessitate dropping that observation from the data set. The coefficient on MG will reflect only the true mental group observations, with the coefficient on MGDUM reflecting the missing observations. In general, the coefficient on this "flagged" variable cannot be unambiguously interpreted.

** Another interpretation of this variable was suggested by an informal reviewer. Essentially this variable distinguishes 4-year obligors who leave the active Navy with no more than 48 months of active duty service from extenders and individuals with active duty obligations longer than 4 years. In the empirical work to follow, the affiliation equations are estimated within rating groups. Most of the ratings involve a 4-year active duty obligation. Thus, in this interpretation the empirical results suggest that 4-year obligors who extend their active duty time--but who do not reenlist--are less likely to join SELRES. The policy implications of this interpretation are clearly less interesting.

appropriate estimation technique, the results can be transformed into an approximation of a probit equation.)* Table 2 lists the ratings and the rating groups.

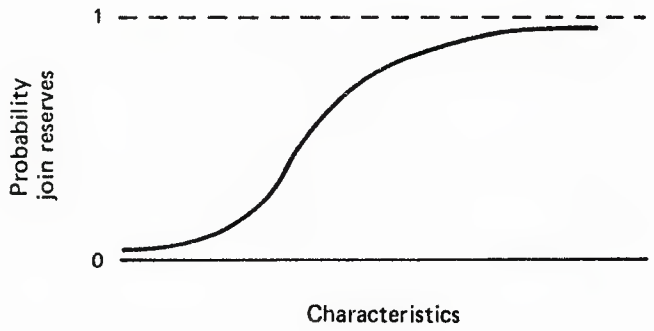

FIG. 1: PROBIT CURVE

The full results of the probit equations estimated for the 23 rating groups are found in appendix B. The probit equations for each of the rating groups fit the data very well. Reserve pay and the unemployment rate are positively related to the enlistment probability and these results are statistically significant at the 1-percent level in all of the 23 probit equations.

Older veterans are more likely to join SELRES (statistically significant in 22 of the 23 rating groups). However in this sample of first-termers, an older veteran is 24 or 25 years old, rather than 21 or 22.

---

* Partitioning the sample into rating groups has the advantage that the enlistment effects of unemployment, pay, and the other explanatory variables can vary among the different rating groups. The disadvantage is that quite large differences among ratings in enlistment probabilities are sometimes obscured. These differences, when responses to the other explanatory variables are held constant, can probably be seen most clearly in the total regression results presented in appendix A.

TABLE 2

RATING GROUPS*

Group	Ratings
1	Aviation Electrician's Mate (AE) Aviation Electronics Technician (AT)
2	Aviation Antisubmarine Warfare Technician (AX) Electronics Technician (ET) Electronics Technician, Communications (ETN)
3	Fire Control Technician, Gun Fire Control (FTG) Fire Control Technician, Surface Missile Fire Control (FTM) Cryptologic Technician, Maintenance (CTM)
4	Electronic Warfare Technician (EW) Sonar Technician, Submarine (STG)
5	Cryptologic Technician, Interpretive (CTI) Air Traffic Controller (AC)
6	Aviation Machinist's Mate (AD)
7	Aviation Support Equipment Technician, Mechanical (ASM) Aviation Machinist's Mate, Reciprocating Engines (ADR) Enginemen (EN)
8	Aircrew Survival Equipmentman (PR) Aviation Structural Mechanic, Safety Equipment (AME)
9	Aviation Structural Mechanic, Hydraulics (AMH)
10	Aviation Structural Mechanic, Structures (AMS) Aviation Support Equipment Technician, Hydraulics and Structures (ASH) Aviation Support Equipment Technician, Electrical (ASE)
11	Construction Mechanic (CM) Equipment Operator (EO)

* Ratings are ordered from highly technical to less technical. Rating groups were constructed with regard to both similarity in terms of technical skills and numbers of observations, e.g., larger ratings were estimated separately.

TABLE 2 (Cont'd)

Group	Ratings
12	Gunner's Mate, Guns (GMG) Gunner's Mate, Missiles (GMM) Gunner's Mate Technician (GMT)
13	Aviation Antisubmarine Warfare Operator (AW) Construction Electrician (CE) Aerographer's Mate (AG)
14	Operations Specialist (OS) Ocean Systems Technician (OT)
15	Intelligence Specialist (IS) Cryptologic Technician, Communications (CTO) Radioman (RM)
16	Torpedoman's Mate (TM) Mineman (MN) Aviation Ordnanceman (AO)
17	Engineering Aid (EA) Molder (ML) Steelworker (SW) Utilitiesman (UT) Builder (BU)
18	Instrumentman (IM) Cryptologic Technician, Collection (CTR) Opticalman (OM)
19	Hospital Corpsman (HM)
20	Signalman (SM)
21	Boatswain's Mate (BM)
22	Boiler Technician (BT)
23	Mess Management Specialist (MS)

Mental group is also a significant predictor of SELRES affiliation with those in the lower mental groups more likely to affiliate. This result, however, requires some discussion. Active duty Navy retention models which include mental group as an explanatory variable generally find a strong inverse relationship between AFQT test scores and retention. In short, those individuals who score the highest on the pencil and paper AFQT test leave the active Navy.

We can compare the mental group characteristics of individuals in these 51 ratings for three categories: those who stay in the active Navy (A), those who leave the active Navy and join SELRES (B), and those who leave the active Navy but do not join SELRES (C). Table 3 gives information on mental group distributions for these three categories.

TABLE 3

MENTAL GROUP DISTRIBUTIONS[a]

	Category A, active Navy[b]	Category B, reservists	Category C, NAVET civilians
% MG I-II			
In category	27%	39%	47%
U.S. pop. norm[c]	35%	35%	35%
% MG I-IIIU			
In category	44%	60%	68%
U.S. pop. norm[c]	51%	51%	51%
% MG I-IIIL			
In category	71%	80%	86%
U.S. pop. norm[c]	69%	69%	69%
Number of observations in group	9039	6512	43012

[a]Individuals are those in 51 ratings as defined in the text. The numbers in group B and group C do not add to 58,035 because 8561 observations were missing AFQT scores. In group A there were 849 observations missing data on AFQT scores.

[b]Data for the active Navy are for FY 1980 only. Categories B and C are for the combined years, FY 1977-80.

[c]For example, 35 percent of the U.S. population are in mental groups I and II.

What emerges from table 3 is that the mental group distribution in the reserves is comparable to that of civilian Navy veterans and above that of active Navy personnel. Moreover, it is considerably above that of the total population.

Table 4 is a summary table of economic effects estimated in the separate probit equations. It includes both summary statistics and policy relevant analytical results. A striking aspect of table 4 is the variance across rating groups in the SELRES affiliation rate. Hospital Corpsmen (HM), for example, are more than twice as likely as Boiler Technicians (BT) to affiliate. Moreover, all of the affiliation rates are low enough to suggest that a substantial pool of Navy veterans exists in the civilian population.

All affiliation rates are sensitive to the unemployment rate* although the magnitude of the effect varies across the different ratings. Elasticities give the percentage change in the enlistment rate for a given percentage change in the explanatory variable. For Aviation Machinist's Mates (AD), for example, a 10-percent increase (decrease) in the unemployment rate of 20- to 24-year-old males will cause a 21-percent increase (decrease) in the enlistment rate. At the mean of the data, this suggests that a rise in the unemployment rate from 10.5 percent to 11.55 percent (a 10-percent increase) would cause the AD affiliation rate to rise from 13 percent to 15.7 percent.

The Navy cannot manipulate the civilian unemployment rate, but these results strongly suggest that if the civilian economy improves, reserve enlistments will fall unless other factors change to make affiliation more attractive. Since the reserves are programmed for end-strength growth, it is important to look at possible policy variables that the military can manipulate.

Perhaps the easiest (and certainly the cheapest) such variable is UMT, universal military training obligation. For 13 of the 23 rating groups, individuals are significantly more likely to join the reserves if they have not fulfilled their 6-year obligation (for two of the rating groups the results are perverse and in the remaining eight ratings UMT obligation makes no difference).

There is currently a proposal, which the Navy has supported, to extend the UMT from 6 years to 8 years. Our results indicate that this would be good news for SELRES affiliation rates. In fact, our results

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* In table 4 and in appendix tables B-1 through B-23 the unemployment rate is for 20- to 24-year-old males.

TABLE 4

POLICY RELEVANT ELASTICITIES:
THREE ECONOMIC SCENARIOS

Rating group (no. of individuals)	Probability enlist SELRES	UMT elasticity[a]	Unemployment elasticity	Pay elasticities for MILCIV1		
				8-percent unemployment	10.5-percent unemployment	12-percent unemployment
AE, AT (N=4799)	11.3%	.3	1.4	1.0	1.3	1.6
AX, ET, ETN (N=2887)	7.7%	.4	2.0	.9	1.5	2.0
FTG, FTM, CTM (N=2056)	8.1%	.4	1.2	1.5	2.0	2.4
EW, STG (N=1150)	7.0%	.4	1.7	1.0	1.6	2.0
CTI, AC (N=1025)	17.9%	Not significant	1.0	.6	.7	1.1
AD (N=3267)	13.0%	Not significant	2.1	1.0	1.6	2.0
ASM, ADR, EN (N=2147)	11.2%	.2	.9	1.4	1.7	1.9
PR, AME (N=1216)	13.7%	Not significant	2.6	.8	1.6	2.1
AMH (N=1737)	11.5%	Not significant	1.9	1.3	2.0	2.5
AMS, ASH, ASE (N=2649)	11.4%	.2	1.6	1.3	2.0	2.3
CM, EO (N=1199)	20.6%	-.3	1.2	.9	1.1	1.2
GMG, GMM, GMT (N=2414)	11.1%	.2	1.8	1.2	1.8	2.1
AW, CE, AG (N=1602)	17.6%	Not significant	1.5	1.4	1.9	2.2
OS, OT (N=3537)	12.7%	Not significant	1.2	1.5	1.9	2.1
IS, CTO, RM (N=4783)	17.8%	.1	1.4	1.1	1.5	1.7
TM, MN, AO (N=2764)	13.0%	.2	2.1	1.0	1.6	2.1

TABLE 4 (Cont'd)

Rating group (no. of individuals)	Probability enlist SELRES	UMT elasticity[a]	Unemployment elasticity	Pay elasticities for MILCIV1		
				8-percent unemployment	10.5-percent unemployment	12-percent unemployment
EA,ML,SW,UT,BU (N=1468)	12.2%	Not significant	2.8	.6	1.0	1.1
IM, CTR, OM (N=623)	13.0%	-.5	2.1	1.3	2.0	2.3
HM (N=5909)	19.0%	.1	1.1	1.0	1.2	1.3
SM (N=825)	14.8%	.3	1.6	1.1	1.5	1.7
BM (N=3719)	13.2%	.2	1.3	1.5	1.9	2.2
BT (N=3839)	8.2%	.2	.9	1.4	1.8	2.0
MS (N=2420)	11.9%	Not significant	.7	.8	.9	1.0

Source: See appendix tables B-1 through B-23. Only results statistically significant at the 1-percent level are reported.

[a]The mean value of the UMT variable is the fraction or percent in the respective group with a remaining universal military training obligation of at least 2 years. An elasticity with respect to a variable of this type refers to a change in the sample composition. For the UMT variable it would represent a percentage in the fraction of Navy veterans leaving the active Navy with a remaining IRR obligation. If, for example, .8 of the AEs currently have a UMT obligation, a 10-percent increase in the sample proportion with a UMT obligation (to .8 percent) indicates a 3-percent increase in SELRES accessions (11.3 to 11.6 percent) or about 144 AEs over the sample period.

suggest that reserve enlistments might increase by 3000 a year should such legislation be enacted.*

Military pay is the most interesting policy variable. In the specification here the variable is the percentage increase in military pay divided by the percentage increase in the CPI (MILCIV1).** For the period of our data, this variable averaged .6. (If reserve pay had kept pace with inflation in each year, the variable would be equal to 1.0.)

Before a discussion of pay elasticities it is worthwhile to remind the reader how the elasticities calculated from this variable differ from what have conventionally been called pay elasticities. What, for example, does it mean if the elasticity of MILCIV1 equals 1.0 and MILCIV1 increases by 20 percent? Since the average value of MILCIV1 equals .6, it says that the variable increases to .72 (a 20-percent increase) and that the accession probability increases from .13 to .156 (a 20-percent increase).

What, though, could cause the pay variable to change from .6 to .66? There are four possibilities:

1. The denominator remains constant or falls and the numerator increases. For example, the CPI percentage increase remains at its historical average but the military pay increase rises from its historical average of 5.9 percent to 7.1 percent.

2. Both the numerator and denominator fall in value but the denominator falls more sharply and the ratio rises to .66.

3. Both the numerator and denominator rise in value with a sharper rise in the numerator.

4. The military pay increase rises or stays at its historical average but the percentage increase in the CPI falls with result that the ratio increases 20 percent.

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* Here we project beyond the boundaries of our data. Such projections are quite rightly treated with caution. Still, we feel that an extension of the UMT from 6 to 8 years is unlikely to hurt non-prior-service active Navy accessions and is likely to help SELRES NAVET accessions. However, some of the effect we attribute to the UMT obligation may in fact be due to other differences between individuals who leave the active Navy after 4 years and who leave after 49-76 months.

** The alternative specification, percentage increase in military pay divided by the percentage increase in the civilian wage level, performs equally well. These results are available from the author.

With information concerning projected increases in the CPI and military pay, one can use the pay elasticities for MILCIV1 to predict changes in SELRES accession.

The condition of the civilian economy is sufficiently important for the elasticities of MILCIV1 that we provide pay elasticities under three economic scenarios. The first is a low unemployment level for 20- to 24-year-old males, namely 8.0 percent. The second is the average unemployment rate observed for this group, namely 10.5 percent. Finally, our high unemployment rate scenario is 12.0 percent. All scenarios fall within the range observed in the sample period.

Perhaps the most important lesson in this analysis is that pay is important. Even at low levels of unemployment for this age group, pay elasticities for our variable usually exceed one. Although we would expect lower unemployment rates as economic conditions improve, we are still quite optimistic about reserve affiliations because of the magnitude of these pay elasticities. Inflation has significantly diminished, and the results indicate enlistments are a function of the purchasing power of military pay. If military pay increases at the rate of the CPI, for example, our results indicate that the fraction of NAVETs who join SELRES will increase substantially, ceteris paribus: taking a low elasticity (1.0) of our variable with respect to pay, accessions increase from .13 to .19 (a 43-percent increase in the accession rate for our sample).

AN ASIDE: ACTIVE MARINER AFFILIATIONS

The Active Mariner Program involves a 3-year commitment with active Navy and then a 3-year commitment with SELRES. (In the 6th year the mandatory drilling obligation with SELRES can be transferred to a nondrilling obligation with the IRR without penalty.) Active Mariner accessions have been approximately 15,000 annually since 1978. Only about 6,000 of these individuals, however, actually make it through their active duty obligation and to a SELRES drill unit.*

Because of the way our data set was constructed, it is relatively easy to find Active Mariners who are comparable with the NAVET observations. Thus, we examined the Active Mariners in these 51 ratings who reached EAOS. Seventy-eight percent of these individuals who reached EAOS affiliated with a SELRES unit. It is interesting to ask, for these mandatory drillers, if economic variables are at all relevant in explaining affiliation rates. (One wedge of conventional wisdom is that Active Mariners who do not affiliate live more than 100 miles from a drill center; if so located, their SELRES obligation is changed to IRR and thus they are no longer required to drill. A different wedge, of

* For more information on the Active Mariner survival patterns, see [5] and [6].

perhaps less conventional wisdom, is that Active Mariners drive more than 100 miles to drill when economic conditions are such that SELRES participation is advantageous.)

In any case, we estimated the identical enlistment equation for the Active Mariners. These results are contained in appendix table A-2. What is interesting is that, even though Active Mariners are legally obligated to affiliate, their affiliation probabilities are influenced by the same economic variables that affect NAVET affiliations. Military pay and the civilian unemployment rate are important in predicting the variations in these Active Mariner affiliation rates.

The elasticities, not surprisingly, are smaller than those for the NAVETs. This is true for at least two reasons. First, NAVETs are making a voluntary choice while Active Mariners have a legal obligation. Second, though, and perhaps even more important, the Active Mariner affiliation rate is much higher than that of NAVETs (78 percent versus 13 percent). While these differences do not entirely explain the differences in the elasticity estimates, they do reduce the divergence by about one-half.*

Appendix table C-1 provides retention statistics for the NAVET and Active Mariner populations. They are not detailed in this discussion but are provided for the interested reader.

It is interesting to compare rating differences, economic and personal characteristics held constant, between NAVETs and Active Mariners and their propensity to affiliate with SELRES. Table 5 contains such a comparison for ratings which show statistically significant positive (or negative) inclinations. It should be noted that all Active Mariner affiliation rates are higher than those for NAVETs. Here we present comparisons within groups; thus, for example, NAVET ETs are significantly less likely than other NAVETs to join SELRES.

What is immediately most interesting is the NAVET pattern of negative propensities for the sea-going ratings. For Active Mariners, an individual's propensities to affiliate with SELRES cannot be so easily defined by rating characteristics.

The majority of the 51 ratings, both for Active Mariners and NAVETs, exhibited neither a positive nor a negative inclination toward SELRES affiliation after controls for personal and economic variables (e.g., the majority of dummy variables for ratings in appendix tables A-1 and A-2 are not statistically significant).

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* Elasticities are calculated at the mean of the data. Thus a 10-percent increase in NAVET affiliations is 1.3 percent while a 10-percent increase in Active Mariner affiliation is 7.8 percent.

TABLE 5

RATING DIFFERENCES IN AFFILIATION PROPENSITIES

	NAVETs	Active Mariners
Ratings in which individuals are significantly less likely to join SELRES	ET, FTG, FTM, STG, BT	EN, AMS, CTO, MN, DT, BT
Ratings in which individuals are significantly more likely to join SELRES	CTI, AW, AG, IS, AX, RM EO, AC	CM, AX

Source: Tables A-1 and A-2 in appendix. Results presented are significant at the 1-percent level.

Although the negative propensities for NAVETs to affiliate with SELRES in sea-going and hard-to-fill ratings have been noted, it should not be cause for alarm. Individuals in these ratings, as shown clearly by the rating group probit equations, are responsive to the real value of reserve pay. They are, quite clearly, candidates for affiliation bonuses if SELRES requires more individuals with these skills.

SUMMARY AND THE ROAD AHEAD

We have shown that:

1. The NAVET affiliation rate with SELRES is positively related to reserve pay and the civilian unemployment rate in each of the 23 rating groups studied.

2. The average affiliation rate was 13 percent, but the rate varied widely across the 23 rating groups. All rates are low enough to suggest that there is a substantial pool of NAVETs in the civilian population.

3. Increases in reserve pay that keep pace with the Consumer Price Index (CPI) substantially increase the NAVET affiliation rate.

4. Although the NAVET affiliation rate has been lower in the sea-going ratings, affiliation bonuses would draw these ratings into SELRES.

5. Older NAVETs (ages 24 and 25) are more likely to affiliate with SELRES than younger veterans.

6. NAVETs with universal military training (UMT) obligations are also more likely to join SELRES, and lengthening UMT obligations would increase the affiliation rate.

7. Active Mariner affiliations with SELRES are influenced by the same military pay and unemployment factors that influence NAVET affiliations.

8. The mental group distribution of the SELRES is comparable with that of civilian Navy veterans and higher than that of the active enlisted Navy.

Another method of procuring SELRES personnel, not detailed here, involves a short active duty commitment (essentially for formal training) and subsequent mandatory SELRES drill participation. Whether it is cost-effective for SELRES to acquire personnel in this manner is an important policy question. Are the costs of training these personnel justified by their later SELRES participation or would it be more cost-effective to try to attract more trained Navy veterans by larger enlistment bonuses? The pay elasticities generated in this paper can be used to compare procurement sources on a rating-by-rating basis. Likewise, these results can be utilized in evaluating policies for filling shortfalls in the Naval Reserve Fleet (NRF). Analysis of these issues, as well as incorporating attrition patterns into a SELRES strength projection model, are goals of the follow-on study to ESRA, namely the Selected Reserve Growth Attainability Study.

REFERENCES

[1] CNA, Memorandum 83-0628, "SELRES Data Collection and Management: Suggestions for Improvement," by Jean Fletcher, Unclassified, 22 Apr 1983

[2] Rand Corporation, R-2866-MRAL, "A Model of Retention Decision of Army National Guardsmen," by Burke Burright, David Grissmer and Zahava Doering, Unclassified, Oct 1982

[3] CNA, Research Contribution 500, "Alternative Accession Policies for Junior Enlisted Personnel in the Naval Selected Reserve: A Total Force Perspective," by Deborah Clay-Mendez, Unclassified, forthcoming

[4] Theil, Henry. Principles of Econometrics. New York: Wiley, 1971

[5] CNA, Memorandum 82-2123.10, "Survival Patterns of Active Mariner and Ready Mariner Recruits," by Deborah Clay-Mendez, Unclassified, 26 Jan 1983

[6] CNA, Memorandum 82-1582.10, "Enlisted Selected Reserve Analyses (ESRA) Study Advisory Committee Working Group Briefing," by Jean Fletcher, Deborah Clay-Mendez, Lawrence Curran and Aline Quester, Unclassified, 27 Oct 1982

[7] Greene, William H. "Estimation of Limited Dependent Variables by Ordinary Least Squares and the Method of Moments." Journal of Econometrics, forthcoming

APPENDIX A

OLS REGRESSIONS FOR NAVETs AND ACTIVE MARINERS

TABLE A-1

NAVETs

	I	II	III	IV
UMT	.031 (8.28)[a]	.029 (7.89)	.035 (9.61)	.035 (9.68)
UR2024	.023 (28.03)	--	.004 (4.30)	--
URadult	--	.059 (25.75)	--	.037 (16.57)
MILCIV1[b]	.494 (54.62)	--	.720 (68.43)	--
MILCIV2[b]	--	.488 (53.94)	--	.716 (70.81)
MG	.017 (15.33)	.017 (15.25)	.017 (16.33)	.017 (16.49)
MGDUM	.035 (6.87)	.017 (3.36)	.161 (29.74)	.147 (26.85)
Age	.025 (29.27)	.026 (30.41)	.017 (20.35)	.017 (20.35)
AE	.001 (.13)	.003 (.30)	-.002 (.22)	-.003 (.32)
ET*	-.019 (1.74)	-.013 (1.20)	-.063 (5.84)	-.067 (6.15)
ETN*	-.095 (7.65)	-.103 (8.25)	-.013 (1.07)	-.013 (1.09)
FTG*	-.022 (1.79)	-.020 (1.62)	-.038 (3.17)	-.037 (3.10)
FTM*	-.022 (1.65)	-.021 (1.58)	-.028 (2.18)	-.030 (2.27)
CTM	-.018 (.71)	-.019 (.75)	-.014 (.57)	-.015 (.61)
EW	-.014 (.70)	-.014 (.74)	-.101 (.55)	-.012 (.65)

TABLE A-1 (Cont'd)

	I	II	III	IV
CTI*	.111 (5.93)	.113 (6.03)	.104 (5.63)	.104 (5.61)
AD	.012 (1.30)	.013 (1.44)	.011 (1.18)	.009 (1.05)
ASM	-.004 (.14)	-.004 (.14)	.006 (.22)	.006 (.22)
ADR	.011 (.45)	.009 (.37)	.020 (.85)	.023 (.97)
EN	-.012 (1.19)	-.011 (1.10)	-.008 (.82)	-.010 (1.00)
PR	-.002 (.12)	.002 (.00)	-.003 (.22)	-.006 (.40)
AMH	-.013 (1.21)	-.010 (.96)	-.021 (1.98)	-.023 (2.23)
AMS	-.013 (1.33)	-.101 (1.04)	-.023 (2.35)	-.026 (2.66)
ASH	-.007 (.22)	-.005 (.20)	-.004 (.16)	-.006 (.23)
CM	.004 (.28)	.003 (.15)	.020 (1.18)	.024 (1.39)
GMG	.005 (.41)	.008 (.76)	-.013 (1.22)	-.016 (1.50)
GMM	-.033 (1.99)	-.026 (1.57)	-.067 (4.15)	-.072 (4.48)
AW*	.107 (7.63)	.108 (7.68)	.112 (8.11)	.108 (7.87)
CE*	-.041 (2.04)	-.044 (2.20)	-.012 (.62)	-.010 (.52)
AG*	.027 (1.82)	.028 (1.87)	.035 (2.39)	.032 (2.12)

TABLE A-1 (Cont'd)

	I	II	III	IV
OS	.013 (1.46)	.016 (1.70)	.003 (.30)	-.0002 (.00)
IS*	.070 (3.19)	.070 (3.16)	.091 (4.18)	.089 (4.13)
CTO	-.030 (.37)	-.031 (.39)	-.025 (.32)	-.024 (.77)
TM	-.001 (.09)	.008 (.06)	-.008 (.64)	-.010 (.42)
MN	.019 (.63)	.021 (.69)	.013 (.42)	.013 (.30)
EA	.027 (.90)	.023 (.77)	.061 (2.06)	.062 (2.09)
ML	.007 (.15)	.010 (.23)	-.004 (.09)	-.010 (.23)
SW	.032 (1.18)	.029 (1.07)	.059 (2.20)	.060 (2.22)
UT	-.031 (1.56)	-.034 (1.74)	.003 (.13)	.002 (.09)
IM	-.001 (.04)	-.001 (.04)	-.003 (.11)	-.003 (.09)
CTR	.027 (1.48)	.031 (1.70)	-.003 (.16)	-.003 (.15)
AME	.010 (.69)	.011 (.83)	.002 (.17)	.001 (.08)
AX*	.040 (2.32)	.041 (2.35)	.028 (1.61)	.032 (1.86)
RM*	.047 (5.42)	.048 (5.63)	.041 (4.82)	.038 (4.54)
ASE	-.013 (.49)	-.012 (.44)	-.010 (.38)	-.012 (.46)

TABLE A-1 (Cont'd)

	I	II	III	IV
AO	.012	.014	.002	.0004
	(1.13)	(1.33)	(.17)	(.03)
EO*	.127	.125	.149	.153
	(9.37)	(9.26)	(11.17)	(11.50)
BU	.002	-.002	.030	.030
	(.13)	(.14)	(2.31)	(2.33)
GMT	-.009	-.006	-.030	-.031
	(.54)	(.33)	(1.81)	(1.87)
STG*	-.052	-.052	-.044	-.047
	(3.97)	(3.95)	(3.38)	(3.58)
AC*	.024	.024	.041	.039
	(1.69)	(1.68)	(2.94)	(2.83)
OM	.017	.018	.015	.017
	(.55)	(.58)	(.49)	(.55)
DT	.020	.020	.028	.026
	(1.25)	(1.26)	(1.74)	(1.66)
HM*	.060	.061	.068	.066
	(7.33)	(7.33)	(8.33)	(8.11)
SM	.019	.022	.006	.003
	(1.45)	(1.69)	(.44)	(.22)
BM	-.012	-.009	-.024	-.026
	(1.34)	(1.00)	(2.66)	(2.95)
BT*	-.044	-.042	-.043	-.047
	(4.94)	(4.69)	(4.92)	(5.34)
MS	-.005	-.003	-.009	-.011
	(.47)	(.32)	(.89)	(1.09)
Constant	-1.073	-1.233	-.924	-1.123
R^2	.09	.09	.12	.12
No. of obs.	58,035	58,035	58,035	58,035

TABLE A-1 (Cont'd)

	I	II	III	IV
Elasticities				
MILCIV	2.24	2.61	3.26	3.83
UR	1.84	2.95	.32	1.85
UMT	.19	.18	.21	.21

[a]Absolute value of the t-statistic.
[b]MILCIV1 is the percent increase in reserve pay divided by the percent increase in the Consumer Price Index. MILCIV2 is the percent increase in reserve pay divided by the percent increase in civilian wages.

* Individuals in ratings which are starred are significantly less (or more) likely to join SELRES.

Note: Since the dependent variable can take on only the values zero and one, ordinary least squares gives inconsistent estimates of the structural parameters. The appropriate model is a maximum likelihood probit, but the number of observations and parameters in the model make such estimation impractical. However, one can obtain consistent estimates of the probit coefficients by a non-iterative procedure [7]. Specifically, the probit coefficients are equal to the coefficients estimated by the OLS model divided by H, where

$$H = f \sqrt{1-(R^2 p(1-p)/f^2)}$$

and f = ordinate of the normal density, evaluated at the mean sample p

$R^2 = R^2$ obtained from OLS regression

p = sample mean proportion.

TABLE A-2

ACTIVE MARINERS

	I	II	III	IV
MILCIV1	.137 (4.97)	.140 (5.05)	--	--
MILCIV2	--	--	.281 (9.24)	.289 (10.02)
UR2024	.014 (5.20)	--	.005 (1.82)	--
URadult	--	.028 (3.63)	--	.015 (1.89)
MG	.006 (1.61)	.007 (1.68)	.003 (.70)	.003 (.74)
MGDUM	-.160 (9.30)	-.165 (9.50)	-.122 (6.84)	-.124 (6.89)
Age	.016 (6.14)	.017 (6.30)	.013 (5.08)	.014 (5.12)
EN	-.064 (2.45)	-.063 (2.40)	-.062 (2.35)	-.061 (2.34)
AMS	-.090 (2.85)	-.089 (2.80)	-.089 (2.83)	-.089 (2.83)
CM	.083 (1.61)	.085 (1.64)	.080 (1.54)	.080 (1.54)
CTO	-.082 (1.50)	-.087 (1.59)	-.052 (.96)	-.054 (.98)
MN	-.104 (1.71)	-.102 (1.67)	-.097 (1.60)	-.097 (1.60)
SW	-.128 (1.46)	-.124 (1.42)	-.125 (1.44)	-.125 (1.43)

TABLE A-2 (Cont'd)

	I	II	III	IV
AX	.085	.084	.086	.087
	(2.22)	(2.19)	(2.26)	(2.27)
OM	.207	.204	.217	.217
	(1.73)	(1.70)	(1.82)	(1.79)
DT	-.178	-.179	-.154	-.155
	(1.42)	(1.44)	(1.24)	(1.24)
BT	-.055	-.056	-.046	-.046
	(1.73)	(1.77)	(1.45)	(1.46)
Constant	.205	.162	.242	.195
R^2a	.04	.04	.05	.05
No. of obs.	8727	8727	8727	8727
Mean dependent variable	.775	.775	.775	.775
Elasticities				
MILCIV1	.10*	.11*	--	--
MILCIV2	--	--	.25*	.26*
UR2024	.19*	--	.07	--
URadult	--	.24*	--	.13

* Significant at the 1-percent level.

Note: The data set is composed of individuals who entered the Navy under the Active Mariner program and who left the Navy in FY 1977-80 (with LOS less than or equal to 42 months and eligible to reenlist). The regressions report the coefficients for only the ratings in which the absolute value of the F-statistic was greater than 2. In addition to the ratings reported, the regressions controlled for all the ratings reported in table A-1.

APPENDIX B

PROBIT EQUATIONS FOR NAVETs

TABLE B-1

AE AND AT

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.58	1.428 (12.10)	.258
UR2024	10.30	.081 (8.04)	.015
UMT	.76	.250 (6.06)	.045
Age	23.85	.094 (9.05)	.017
MG	2.23	.097 (6.00)	.017
MGDUM	.16	.168 (2.77)	.030
AE	.57	-.015 (-.43)	-.003
Constant	1.00	-5.60 (-19.17)	-1.009
Chi square		184.78	
No. of obs.		4799	
Mean dependent		.113	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.32	1.02	1.56
UR2024	1.37	.79	1.83
UMT	.30		

TABLE B-2

AX, ET, ETN

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.584	1.684 (8.72)	.202
UR2024	10.408	.124 (9.61)	.015
UMT	.384	.672 (13.11)	.081
Age	24.607	.095 (6.98)	.011
MG	1.797	.080 (2.33)	.010
MGDUM	.122	.146 (1.47)	.017
AX	.141	.349 (4.54)	.042
ET	.510	.059 (.91)	.007
Constant	1.00	-6.668 (-16.69)	-.800
Chi square		172.89	
No. of obs.		2887	
Mean dependent		.077	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.53	.91	2.00
UR2024	2.03	.94	3.07
UMT	.40		

TABLE B-3

FTG, FTM, CTM

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.57	2.230 (12.21)	.280
UR2024	10.309	.075 (5.30)	.009
UMT	.580	.454 (7.77)	.057
Age	24.156	.125 (7.93)	.016
MG	2.027	.096 (3.05)	.020
MGDUM	.104	.158 (1.49)	.012
FTG	.513	-.289 (-3.04)	-.036
FTM	.400	-.266 (-2.80)	-.033
Constant	1.00	-6.793 (-15.33)	-.854
Chi square		144.30	
No. of obs.		2056	
Mean dependent		.081	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.97	1.50	2.38
UR2024	1.15	.67	1.59
UMT	.41		

TABLE B-4

EW AND STG

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.57	1.724 (6.81)	.191
UR2024	10.49	.099 (4.97)	.011
UMT	.44	.519 (6.57)	.058
Age	24.48	.133 (5.91)	.015
MG	1.82	.067 (1.29)	.007
MGDUM	.15	-.283 (-2.01)	-.031
EW	.27	.213 (2.93)	.024
Constant		-7.243 (-11.71)	-.803
Chi square		63.66	
No. of obs.		1150	
Mean dependent		.070	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.56	1.01	1.96
UR2024	1.65	.82	2.37
UMT	.36		

TABLE B-5

CTI AND AC

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	.828 (3.16)	.208
UR2024	10.39	.066 (2.86)	.017
UMT	.72	-.057 (-.70)	-.014
Age	24.31	.113 (5.53)	.028
MG	1.89	.008 (.17)	.002
MGDUM	.18	.081 (.56)	.020
CTI	.33	.293 (3.83)	.074
Constant	1.00	-4.970 (-8.36)	-1.251
Chi square		45.11	
No. of obs.		1025	
Mean dependent		.179	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	.69	.58	1.09
UR2024	.99	.63	1.76
UMT	Not statistically significant		

TABLE B-6

AD

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	1.810 (13.23)	.347
UR2024	10.33	.138 (11.23)	.026
UMT	.84	.049 (.88)	.009
Age	23.45	.126 (9.47)	.024
MG	2.65	.073 (4.67)	.014
MGDUM	.14	.116 (1.56)	.022
Constant	1.00	-6.923 (-19.27)	-1.329
Chi square		238.91	
No. of obs.		3267	
Mean dependent		.130	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.57	1.02	2.03
UR2024	2.07	1.05	3.14
UMT	Not statistically significant		

TABLE B-7

ASM, ADR, EN

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.60	1.788 (10.87)	.310
UR2024	10.28	.055 (3.49)	.010
UMT	.90	.172 (2.04)	.030
Age	23.14	.133 (7.52)	.023
MG	2.94	.091 (5.32)	.016
MGDUM	.17	.120 (1.37)	.021
ASM	.07	.052 (.57)	.009
ADR	.09	.103 (1.20)	.018
Constant	1.00	-6.464 (-13.52)	-1.122
Chi square		129.09	
No. of obs.		2147	
Mean dependent		.112	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.66	1.40	1.86
UR2024	.92	.58	1.15
UMT	.24		

TABLE B-8

PR, AME

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.60	1.938 (8.79)	.354
UR2024	10.44	.185 (9.53)	.034
UMT	.85	.078 (.81)	.014
Age	23.57	.150 (7.25)	.027
MG	2.70	.072 (2.49)	.013
MGDUM	.12	-.001 (.008)	-.0002
PR	.40	-.049 (-.75)	-.009
Constant	1.00	-8.123 (-14.24)	-1.483
Chi square		135.68	
No. of obs.		1216	
Mean dependent		.137	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.55	.80	2.14
UR2024	2.59	1.02	4.08
UMT	Not statistically significant		

TABLE B-9

AMH

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	2.248 (12.14)	.385
UR2024	10.52	.122 (7.67)	.021
UMT	.83	-.082 (-1.07)	-.014
Age	23.52	.081 (4.64)	.014
MG	2.96	.055 (2.67)	.009
MGDUM	.12	.372 (3.49)	.064
Constant	1.00	-5.956 (-12.45)	-1.021
Chi square		148.05	
No. of obs.		1737	
Mean dependent		.115	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.98	1.26	2.46
UR2024	1.92	.93	2.71
UMT	Not statistically significant		

TABLE B-10

AMS, ASH, ASE

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	2.162 (13.95)	.375
UR2024	10.56	.098 (7.58)	.017
UMT	.85	.127 (1.95)	.022
Age	23.53	.117 (8.27)	.020
MG	2.91	.045 (2.73)	.008
MGDUM	.13	.094 (1.13)	.094
AMS	.87	.015 (.16)	.003
ASH	.07	.057 (.47)	.010
Constant	1.00	-6.614 (-16.70)	-1.148
Chi square		211.48	
No. of obs.		2649	
Mean dependent		.114	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.94	1.34	2.30
UR2024	1.57	.82	2.12
UMT	.16		

TABLE B-11

CM, EO

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.64	1.247 (5.68)	.338
UR2024	9.68	.093 (3.09)	.025
UMT	.82	-.318 (-3.53)	-.086
Age	23.28	-.024 (-1.07)	-.006
MG	2.60	.165 (5.98)	.045
MGDUM	.17	.40 (3.17)	.108
CM	.34	-.428 (-6.21)	-.116
Constant	1.00	-2.114 (-3.40)	-.573
Chi square		97.96	
No. of obs.		1199	
Mean dependent		.206	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.05	.90	1.23
UR2024	1.17	.83	1.72
UMT	-.34		

TABLE B-12

GMG, GMM, GMT

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.57	2.080 (12.14)	.347
UR2024	10.68	.095 (7.34)	.019
UMT	.83	.180 (2.77)	.030
Age	23.39	.127 (8.57)	.021
MG	2.93	.090 (5.60)	.015
MGDUM	.11	.249 (2.80)	.042
GMG	.63	.082 (1.36)	.014
GMM	.20	-.167 (-2.27)	-.028
Constant	1.00	-6.956 (-17.31)	-1.161
Chi square		203.15	
No. of obs.		2414	
Mean dependent		.111	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.78	1.22	2.07
UR2024	1.83	.78	1.99
UMT	.22		

TABLE B-13

AW, CE, AG

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.61	2.324 (11.93)	.546
UR2024	10.41	.108 (5.69)	.025
UMT	.81	.003 (.05)	.001
Age	23.86	.103 (5.89)	.024
MG	1.89	.004 (.10)	.001
MGDUM	.19	.122 (1.06)	.029
AW	.44	.311 (4.90)	.073
CE	.19	-.370 (-4.55)	-.087
Constant	1.00	-6.133 (-12.27)	-1.439
Chi square		197.64	
No. of obs.		1602	
Mean dependent		.176	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.89	1.40	2.22
UR2024	1.48	.85	2.03
UMT	Not statistically significant		

TABLE B-14

OS, OT

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.58	2.176 (15.51)	.412
UR2024	10.53	.075 (6.66)	.014
UMT	.81	.080 (1.60)	.015
Age	23.76	.103 (9.07)	.020
MG	2.18	.120 (.83)	.023
MGDUM	.14	.334 (4.49)	.063
OS	.86	-.074 (-1.35)	-.014
Constant	1.00	-6.024 (-18.68)	-1.142
Chi square		273.17	
No. of obs.		3537	
Mean dependent		.127	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.88	1.47	2.14
UR2024	1.16	.69	1.52
UMT	Not statistically significant		

TABLE B-15

IS, CTO, RM

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	1.818 (16.20)	.444
UR2024	10.48	.096 (9.71)	.023
UMT	.77	.075 (1.83)	.018
Age	23.69	.129 (12.81)	.031
MG	2.96	.123 (8.86)	.030
MGDUM	.14	.249 (3.77)	.061
ISCTO*	.05	.138 (1.86)	.034
Constant	1.00	-6.588 (-23.17)	-1.610
Chi square		458.44	
No. of obs.		4783	
Mean dependent		.178	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.47	1.13	1.69
UR2024	1.35	.81	1.81
UMT	.08		

* These two ratings are combined because the CTO rating is too small to estimate an independent effect for.

TABLE B-16

TM, MN, AO

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	1.908 (13.31)	.361
UR2024	10.40	.137 (10.61)	.026
UMT	.81	.167 (2.85)	.032
Age	23.35	.143 (9.65)	.027
MG	3.04	.062 (3.80)	.012
MGDUM	.13	-.024 (-.28)	-.005
TM	.33	-.078 (-1.71)	-.015
MN	.04	.049 (.46)	.009
Constant	1.00	-7.433 (-19.04)	-1.409
Chi square		268.29	
No. of obs.		2764	
Mean dependent		.130	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.64	1.04	2.07
UR2024	2.08	1.02	3.04
UMT	.20		

TABLE B-17

EA, ML, SW, UT, BU

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.61	1.059 (5.20)	.203
UR2024	9.98	.178 (7.25)	.034
UMT	.87	.003 (.03)	.0004
Age	23.58	.072 (3.60)	.014
MG	2.40	.002 (.09)	.0003
MGDUM	.22	-.210 (-1.97)	-.040
EA	.08	.147 (1.33)	.028
ML	.04	-.053 (-.34)	-.010
SW	.10	.204 (2.03)	.040
UT	.21	-.110 (-1.47)	-.022
Constant	1.00	-5.299 (-9.38)	-1.017
Chi square		59.75	
No. of obs.		1468	
Mean dependent		.122	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.02	.63	1.09
UR2024	2.78	1.38	3.60
UMT		Not statistically significant	

TABLE B-18

IM, CTR, OM

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.58	2.457 (7.55)	.449
UR2024	10.27	.142 (5.33)	.026
UMT	.82	-.472 (-3.83)	-.086
Age	23.67	.052 (1.83)	.009
MG	2.57	.088 (1.98)	.016
MGDUM	.12	.200 (1.06)	.036
IM	.22	-.120 (-.85)	-.022
CTR	.60	.030 (.25)	.006
Constant	1.00	-5.215 (-6.74)	-.952
Chi square		67.06	
No. of obs.		623	
Mean dependent		.130	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	2.00	1.28	2.25
UR2024	2.05	1.02	3.18
UMT	-.54		

TABLE B-19

HM

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.60	1.440 (14.05)	.380
UR2024	10.36	.077 (8.05)	.020
UMT	.86	.090 (2.10)	.024
Age	23.91	.100 (11.30)	.026
MG	2.42	.082 (6.14)	.022
MGDUM	.19	.255 (4.68)	.067
Constant	1.00	-5.282 (-21.23)	-1.393
Chi square		318.58	
No. of obs.		5909	
Mean dependent		.190	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.20	.99	1.33
UR2024	1.09	.70	1.41
UMT	.11		

TABLE B-20

SM

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	1.740 (6.50)	.371
UR2024	10.60	.105 (4.52)	.022
UMT	.84	.276 (2.42)	.059
Age	23.45	.136 (5.57)	.029
MG	3.03	.077 (2.96)	.017
MGDUM	.15	.089 (.63)	.019
Constant	1.00	-6.921 (-10.42)	-1.475
Chi square		75.08	
No. of obs.		825	
Mean dependent		.148	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.48	1.05	1.71
UR2024	1.58	1.29	2.10
UMT	.33		

TABLE B-21

BM

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.60	2.191 (17.59)	.425
UR2024	10.53	.082 (7.49)	.016
UMT	.89	.166 (2.68)	.032
Age	23.32	.107 (9.47)	.021
MG	4.01	.043 (3.87)	.008
MGDUM	.13	.197 (2.66)	.038
Constant	1.00	-6.197 (-19.59)	-1.203
Chi square		321.75	
No. of obs.		3719	
Mean dependent		.132	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.93	1.47	2.22
UR2024	1.28	.73	1.65
UMT	.22		

TABLE B-22

BT

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.59	1.963 (14.93)	.251
UR2024	10.58	.058 (5.16)	.007
UMT	.87	.149 (2.71)	.019
Age	23.23	.162 (13.44)	.021
MG	3.05	.115 (8.45)	.015
MGDUM	.14	.283 (4.08)	.036
Constant	1.00	-7.574 (-22.91)	-.966
Chi square		250.72	
No. of obs.		3839	
Mean dependent		.082	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	1.81	1.42	2.03
UR2024	.90	.58	1.23
UMT	.20		

TABLE B-23

MS

	Variable mean	Probit coefficient	Derivative of conditional mean function
MILCIV1	.58	1.052 (6.10)	.195
UR2024	10.38	.041 (2.87)	.008
UMT	.90	.101 (1.32)	.019
Age	23.32	.144 (9.86)	.027
MG	3.43	.085 (5.43)	.016
MGDUM	.14	.306 (3.43)	.057
Constant	1.00	-6.060 (-15.08)	-1.120
Chi square		99.16	
No. of obs.		2420	
Mean dependent		.119	

ELASTICITIES

	At mean	At 8% unemployment	At 12% unemployment
MILCIV1	.95	.84	1.03
UR2024	.70	.45	.83
UMT	Not statistically significant		

APPENDIX C

RETENTION DATA FOR SAMPLE

TABLE C-1

RETENTION DATA FOR SAMPLE

	NAVETs		Active Mariners	
	Number entered	% stay at least 1 year	Number entered	% stay at least 1 year
Over all ratings	6256	43%	6668	76%
AE	284	45%	210	75%
AT	191	48%	319	77%
AX	47	--	142	76%
ET	76	47%	95	68%
ETN	62	61%	94	87%
FTG	66	47%	160	85%
FTM	48	--	36	--
CTM	14	--	1	--
EW	23	--	31	--
STG	41	--	71	73%
CTI	76	57%	4	--
AC	96	47%	76	76%
AD	357	36%	430	73%
ASM	17	--	28	--
ADR	20	--	8	--
EN	158	32%	436	75%
PR	52	42%	43	--
AME	70	33%	75	75%
AMH	151	31%	202	72%
AMS	201	38%	200	77%
ASH	20	--	19	--
ASE	14	--	15	--
CM	45	--	63	79%
EO	190	64%	134	74%
GMG	150	41%	176	70%
GMM	26	--	24	--
GMT	35	--	21	--
AW	131	38%	168	71%
CE	19	--	14	--
AG	78	38%	28	--
OS	294	36%	221	75%
OT	64	66%	7	--
IS	46	--	67	82%
CTO	1	--	40	--
RM	645	45%	777	81%
TM	82	38%	77	77%
MN	14	--	33	--

TABLE C-1 (Cont'd)

	NAVETs		Active Mariners	
	Number entered	% stay at least 1 year	Number entered	% stay at least 1 year
AO	179	37%	193	71%
EA	17	--	7	--
ML	5	--	15	--
SW	23	--	14	--
UT	26	--	18	--
BU	87	47%	62	74%
IM	11	--	24	--
CTR	42	--	65	83%
OM	13	--	12	--
HM	973	48%	423	79%
SM	93	41%	156	78%
BM	375	41%	517	74%
BT	250	32%	203	72%
MS	258	40%	414	77%

Note: The percent who stay in SELRES for at least 1 year was computed only for cells with at least 50 individuals. The correlation between the percent of NAVETs and percent of Active Mariners who remain in SELRES at least 1 year is +.44.

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